# USEFUL ALLOYS

AND

# MEMORANDA

FOR

## Goldsmiths, Jewellers, Etc.

COLLINS.

Institute, or by members or holders of second class stock, who have obtained the sanction of the Committee. The second class shall include those books intended for circulation.

ARTICLE VI.—The Secretary shall have authority to loan to Members and to holders of second class stock, any work belonging to the SECOND CLASS, subject to the following regulations:

*Section 1.*—No individual shall be permitted to have more than *two books* out at one time, without a written permission, signed by at least two members of the Library Committe; nor shall a book be kept out more than TWO WEEKS; but if no one has applied for it, the former borrower may renew the loan. Should any person have applied for it, the latter shall have the preference.

*Section 2.*—A FINE OF TEN CENTS PER WEEK shall be exacted for the detention of a book beyond the limited time; and if a book be not returned within three months it shall be deemed lost, and the borrower shall, in addition to his fines, forfeit its value.

*Section 3.*—Should any book be returned injured, the borrower shall pay for the injury, or replace the book, as the Library Committee may direct; and if one or more books, belonging to a set or sets, be lost, the borrower shall replace them or make full restitution.

ARTICLE VII.—Any person removing from the Hall, without permission from the proper authorities, any book, newspaper or other property in charge of the Library Committee, shall be reported to the Committee, who may inflict any fine not exceeding twenty-five dollars.

ARTICLE VIII.—No member or holder of second class stock, whose annual contribution for the current year shall be unpaid or who is in arrears for fines, shall be entitled to the privileges of the Library or Reading Room.

ARTICLE IX.—If any member or holder of second class stock, shall refuse or neglect to comply with the foregoing rules, it shall be the duty of the Secretary to report him to the Committee on the Library.

ARTICLE X.—Any Member or holder of second class stock, detected in mutilating the newspapers, pamphlets or books belonging to the Institute shall be deprived of his right of membership, and the name of the offender shall be made public.

# PRIVATE BOOK

FOR

# GOLDSMITHS, JEWELLERS, ETC.

THE

# PRIVATE BOOK

OF

## Useful Alloys and Memoranda

FOR

## GOLDSMITHS, JEWELLERS, ETC.

By JAMES E. COLLINS,

Civil and Mechanical Engineer.

New York:
D. VAN NOSTRAND, Publisher,
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1872.

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27 Rose Street.

# CONTENTS.

# PREFACE.

THIS little book is compiled from notes made by the Author from the papers of one of the largest and most eminent Manufacturing Goldsmiths and Jewellers in this country; and as this Firm is now no longer in existence, and the Author is at present engaged in some other undertaking, he now offers to the public the benefit of his experience, and, in so doing, he begs to state that all the Alloys, etc., given in these pages may be confidently relied on as being thoroughly practicable.

The Memoranda and Receipts throughout this book are also compiled from practice, and will, no doubt, be found equally useful to the practical Jeweller.

SHIRLEY, July, 1871.

# Private Book

FOR

# GOLDSMITHS, ETC.

## *Gold.*

STANDARD gold is compounded of 440 grains of fine gold, and 40 grains (Troy weight) to the oz. alloy; therefore, when you judge how much gold a piece of work will take, compound it to the standard weight by the following Table:

## *Assay Weight.*

The weight of gold is a pound, which is divided into 12 oz.; each oz. into 24 carats; each carat * into 4 grains; and, lastly, each grain into 4 quarters: then you see the Assay quarter-grain, in reality one grain and a quarter Troy.

* The carat is an Abyssinian weight.

QUANTITY OF STANDARD GOLD TO COMPOUND AN OZ. OF ANY OF THE FOLLOWING ALLOYS, CALCULATED TO THE ¼th OF A GRAIN, IS AS FOLLOWS :—

| Carat. | Dwts. | Grs. | Qrs. | | Dwts. | Grs. | Qrs. |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 21 | 9 | | 19 | 2 | 2 |
| 2 | 1 | 19 | 7 | | 18 | 4 | 4 |
| 3 | 2 | 17 | 5 | | 17 | 6 | 6 |
| 4 | 3 | 15 | 3 | | 16 | 8 | 8 |
| 5 | 4 | 13 | 1 | | 15 | 10 | 10 |
| 6 | 5 | 10 | 10 | | 14 | 13 | 1 |
| 7 | 6 | 8 | 8 | | 13 | 15 | 3 |
| 8 | 7 | 6 | 6 | | 12 | 17 | 5 |
| 9 | 8 | 4 | 4 | | 11 | 19 | 7 |
| 10 | 9 | 2 | 2 | | 10 | 21 | 9 |
| 11 | 10 | 0 | 0 | | 10 | 0 | 0 |
| 12 | 10 | 21 | 9 | | 9 | 2 | 2 |
| 13 | 11 | 19 | 7 | | 8 | 4 | 4 |
| 14 | 12 | 17 | 5 | | 7 | 6 | 6 |
| 15 | 13 | 15 | 3 | | 6 | 8 | 8 |
| 16 | 14 | 13 | 1 | | 5 | 10 | 10 |
| 17 | 15 | 10 | 10 | | 4 | 13 | 1 |
| 18 | 16 | 8 | 8 | | 3 | 15 | 3 |
| 19 | 17 | 6 | 6 | | 2 | 17 | 5 |
| 20 | 18 | 4 | 4 | | 1 | 19 | 7 |
| 21 | 19 | 2 | 2 | | 0 | 21 | 9 |
| 22 | 20 | 0 | 0 | | | | |

ALLOY TO BE ADDED.

## *Carat of Gold.*

| | Dwts. | Grs. |
|---|---|---|
| Of a Pound . . . . . | 10 | 0 |
| Grain of do. . . . . | 2 | 12 |
| Quarter-grain of do. . . . | 0 | 15 |
| Of an Oz. . . . . | 0 | 20 |
| Grain of do. . . . . | 0 | 5 |
| Quarter-grain of do. . . . | 0 | 1¼ |

## *Sterling Gold Alloy*—77*s.* 10½*d. per Oz.*

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 18 | 12 |
| Fine Silver . . . . | 0 | 1 | 0 |
| Swedish Copper . . | 0 | 0 | 12 |
| | 1 | 0 | 0 |

## *Dry-Colored Gold Alloys.*

### 17 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 15 | 0 |
| Fine Silver . . . . | 0 | 1 | 10 |
| Swedish Copper . . | 0 | 4 | 17 |
| | 1 | 1 | 3 |

*Dry-Colored Gold Alloys (continued).*

### 18 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . . | 0 | 4 | 10 |
| Swedish Copper . . | 0 | 2 | 5 |
| | 1 | 6 | 15 |

### Another 18 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 15 | 0 |
| Fine Silver . . . | 0 | 2 | 4 |
| Swedish Copper . . | 0 | 2 | 19 |
| | 0 | 19 | 23 |

### Another 18 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 18 | 0 |
| Fine Silver . . . | 0 | 2 | 18 |
| Swedish Copper . . | 0 | 3 | 18 |
| | 1 | 4 | 12 |

*Dry-Colored Gold Alloys (continued).*

### Another 18 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 1 | 6 |
| Fine Silver . . . | 0 | 3 | 10 |
| Swedish Copper . . | 0 | 4 | 12 |
| | 1 | 9 | 4 |

### 19 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 2 | 6 |
| Swedish Copper . . | 0 | 3 | 12 |
| | 1 | 5 | 18 |

### 20 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 2 | 0 |
| Swedish Copper . . | 0 | 2 | 4 |
| | 1 | 4 | 4 |

*Dry-Colored Gold Alloys (continued).*

**22 Carat.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 18 | 0 |
| Fine Silver . . . | 0 | 0 | 12 |
| Swedish Copper . . | 0 | 1 | 3 |
| | 0 | 19 | 15 |

In making Gold Solder for the foregoing alloys, take of the alloyed gold you are using—

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Alloyed . . . | 0 | 1 | 0 |
| Fine Silver . . . | 0 | 0 | 6 |
| | 0 | 1 | 6 |

*or,*

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Alloyed . . . | 0 | 1 | 0 |
| Fine Silver . . . | 0 | 0 | 5 |
| Swedish Copper . . | 0 | 0 | 1 |
| | 0 | 1 | 6 |

*Dry-Colored Gold Alloys (continued).*

### Alloy for Dry-Colored Rings.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 4 | 6 |
| Swedish Copper . . | 0 | 4 | 6 |
| | 1 | 8 | 12 |

### Solder for the Above.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Scrap Gold . . . | 2 | 0 | 0 |
| Fine Silver . . . | 0 | 3 | 0 |
| Swedish Copper . . | 0 | 3 | 0 |
| | 2 | 6 | 0 |

### Another Dry-Colored Alloy.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 5 | 0 | 0 |
| Fine Silver . . . | 1 | 0 | 0 |
| Swedish Copper . . | 1 | 7 | 12 |
| | 7 | 7 | 12 |

*Dry-Colored Gold Alloys (continued).*

**Dry-Colored Scrap, reduced to 35s. Gold.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Colored Scrap . . . | 1 | 9 | 12 |
| Fine Silver . . . | 0 | 2 | 0 |
| Swedish Copper . . | 0 | 17 | 12 |
| Spelter . . . . | 0 | 4 | 0 |
| | 2 | 13 | 0 |

*Of Dry-Coloring the foregoing Alloys.*

This is done as follows:—Having your work well polished, take of Saltpetre, Alum, and Salt in proportion to the work to be colored; say, for 2 oz. of work, as under, viz.:

| | |
|---|---|
| Saltpetre . . . . | 8 oz. |
| Alum . . . . | 4 oz. |
| Salt . . . . . | 4 oz. |

Procure also a black-lead pot, four or five inches high, or an iron pot cast from a black-lead pot—one or two sizes will be useful. To perform the process of Dry-Coloring, you must

have a thin iron bar to stir your "color" when dissolving. Your work cannot be too well polished; it is then cleaned with soda, soap, and hot water, and dried in box-sawdust. It must be afterwards covered with a thin layer of Borax; annealed and boiled out, and again dried in box-sawdust; and finally hung on platinum, or fine silver wire. When the "color" is in the pot, it is placed in the fire on a forge, and blown with bellows; it soon boils up. The heat cannot be too strong. When it assumes a brown-yellow flame, the work is dipped in for two or three seconds, and quenched in hot water diluted with Muriatic Acid, which removes any "color" that may adhere to the work. This ought to produce the color required; if it does not come, the same process must be followed again; but the work must be well dried before going into the "color," otherwise it will fly about, the burn or scald from which is very severe. Indeed, it is recommended to wear an old glove to save the hand. The color-pot must

be emptied immediately upon the forge, so that it may be ready if required again. In this process of coloring it is necessary to be very quick, whereas in wet-coloring it takes time. The waste "color" may be thrown into the sweep, as the gold lost is trifling.

## *Wet-Colored Gold Alloys.*

### Alloy No. 1.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 3 | 12 |
| Swedish Copper . . | 0 | 9 | 0 |
| | 1 | 12 | 12 |

### Alloy No. 2.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 4 | 0 |
| Swedish Copper . . | 0 | 9 | 12 |
| | 1 | 13 | 12 |

## *Wet-Colored Gold Alloys (continued).*

### Alloy No. 3.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 4 | 12 |
| Swedish Copper . . | 0 | 10 | 0 |
| | 1 | 14 | 12 |

### Alloy No. 4.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 4 | 12 |
| Swedish Copper . . | 0 | 10 | 12 |
| | 1 | 15 | 0 |

### Green Gold for Fancy Work.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 6 | 16 |
| | 1 | 6 | 16 |

## *Wet-Colored Gold Alloys (continued).*

### Another Green Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 10 | 0 |
| Fine Silver . . . | 0 | 2 | 2 |
| | 0 | 12 | 2 |

### Another Green Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 5 | 0 |
| Fine Silver . . . | 0 | 1 | 12 |
| | 0 | 6 | 12 |

### Red Gold for Fancy Work.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 5 | 0 |
| Swedish Copper . . | 0 | 2 | 12 |
| | 0 | 7 | 12 |

*Wet-Colored Gold Alloys* (*continued*).

**Another Red Gold.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 5 | 0 |
| Swedish Copper . . | 0 | 1 | 6 |
| | 0 | 6 | 6 |

To make Gold Solder for the foregoing alloys, take of the alloyed gold you are using—

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Alloyed . . . | 0 | 1 | 0 |
| Fine Silver . . . | 0 | 0 | 6 |
| | 0 | 1 | 6 |

Or 5 grains of silver and 1 grain of copper may be used.

**Another Solder.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Alloyed . . . | 0 | 1 | 0 |
| Fine Silver . . . | 0 | 0 | 5 |
| Pin-Brass . . . . | 0 | 0 | 1 |
| | 0 | 1 | 6 |

NOTE.—This solder is good for repairing, and will not disturb the solder first mentioned. It will color well.

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In fancy-work, platinum is used for grey or white flowers, as also fine silver, and fine gold for yellow flowers; but it remains with workmen to please themselves; if they desire to have good red or green gold, the fine gold must not be overpowered.

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**Wet-Colored Solder.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Wet-Colored Scrap . . | 3 | 0 | 0 |
| Fine Silver . . . | 0 | 10 | 0 |
| Swedish Copper . . | 0 | 5 | 0 |
| | 3 | 15 | 0 |

**15 Carat Gold.—Cost 56s. per Oz.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 18 | 0 |
| Fine Silver . . . | 0 | 12 | 12 |
| Swedish Copper . . | 0 | 10 | 0 |
| | 3 | 0 | 12 |

## *Wet-Colored Gold Alloys (continued).*

### Alloy No. 5.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 8 | 0 |
| Swedish Copper . . | 0 | 4 | 0 |
| | 1 | 12 | 0 |

### Alloy No. 6.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 6 | 0 |
| Swedish Copper . . | 0 | 8 | 0 |
| | 1 | 14 | 0 |

### Gold Solder for the Above.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Scrap . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 5 | 0 |
| | 1 | 5 | 0 |

## *Wet-Colored Gold Alloys (continued).*

### 60s. Gold.—Good Color.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold | 1 | 0 | 0 |
| Fine Silver | 0 | 6 | 0 |
| Swedish Copper | 0 | 4 | 0 |
| | 1 | 10 | 0 |

### Another Wet-Colored Solder.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Scrap Gold | 4 | 0 | 0 |
| Fine Silver | 0 | 13 | 8 |
| Swedish Copper | 0 | 6 | 16 |
| | 5 | 0 | 0 |

### To Reduce 22 Carat into Wet-Colored Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Coins | 4 | 8 | 0 |
| Fine Silver | 0 | 13 | 0 |
| Swedish Copper | 1 | 13 | 0 |
| | 6 | 14 | 0 |

## *Ordinary Wet-Colored Gold.*

TABLE SHOWING THE PROPORTIONS OF ALLOY WITH FROM ONE OZ. UP TO TEN OZ. OF FINE GOLD.

| Fine Gold. | | | Fine Silver. | | | Swedish Copper. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Oz. | Dwts. | Grs. | Oz. | Dwts. | Grs. | Oz. | Dwts. | Grs. | Oz. | Dwts. | Grs. |
| 1 | 0 | 0 | 0 | 4 | 12 | 0 | 10 | 12 | 1 | 15 | 0 |
| 2 | 0 | 0 | 0 | 9 | 0 | 1 | 1 | 0 | 3 | 10 | 0 |
| 3 | 0 | 0 | 0 | 13 | 12 | 1 | 11 | 12 | 5 | 5 | 0 |
| 4 | 0 | 0 | 0 | 18 | 0 | 2 | 2 | 0 | 7 | 0 | 0 |
| 5 | 0 | 0 | 1 | 2 | 12 | 2 | 12 | 12 | 8 | 15 | 0 |
| 6 | 0 | 0 | 1 | 7 | 0 | 3 | 3 | 0 | 10 | 10 | 0 |
| 7 | 0 | 0 | 1 | 11 | 12 | 3 | 13 | 12 | 12 | 5 | 0 |
| 8 | 0 | 0 | 1 | 16 | 0 | 4 | 4 | 0 | 14 | 0 | 0 |
| 9 | 0 | 0 | 2 | 0 | 12 | 4 | 14 | 12 | 15 | 15 | 0 |
| 10 | 0 | 0 | 2 | 5 | 0 | 5 | 5 | 0 | 17 | 10 | 0 |

## *Different Methods of reducing 22 Carat to Ordinary Wet-Colored Gold.*

### With Scrap.

#### No. 1.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 1 | 0 | 0 |
| Fine Gold | 3 | 0 | 0 |
| Fine Silver | 0 | 17 | 12 |
| Swedish Copper | 2 | 1 | 12 |
| Scrap | 3 | 1 | 0 |
| | 10 | 0 | 0 |

#### No. 2.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 1 | 0 | 0 |
| Fine Gold | 4 | 0 | 0 |
| Fine Silver | 1 | 2 | 0 |
| Swedish Copper | 2 | 12 | 0 |
| Scrap | 1 | 6 | 0 |
| | 10 | 0 | 0 |

No. 3.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 2 | 0 | 0 |
| Fine Gold | 3 | 3 | 8 |
| Fine Silver | 1 | 1 | 4 |
| Swedish Copper | 2 | 10 | 12 |
| Scrap | 1 | 5 | 0 |
| | 10 | 0 | 0 |

No. 4.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 3 | 1 | 6 |
| Fine Gold | 2 | 0 | 0 |
| Fine Silver | 1 | 1 | 0 |
| Swedish Copper | 2 | 11 | 0 |
| Scrap | 1 | 6 | 18 |
| | 10 | 0 | 0 |

No. 5.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 1 | 0 | 0 |
| Fine Gold | 4 | 0 | 0 |
| Fine Silver | 1 | 1 | 12 |
| Swedish Copper | 2 | 11 | 12 |
| Scrap | 6 | 7 | 0 |
| | 15 | 0 | 0 |

## *Different Methods of reducing 22 Carat to Ordinary Wet-Colored Gold.*

### Without Scrap.

#### No. 1.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins . . . . . | 1 | 0 | 0 |
| Fine Gold . . . . | 8 | 0 | 0 |
| Fine Silver . . . | 2 | 0 | 0 |
| Swedish Copper . . | 4 | 14 | 0 |
| | 15 | 14 | 0 |

#### No. 2.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins . . . . . | 1 | 0 | 0 |
| Fine Gold . . . . | 2 | 0 | 0 |
| Fine Silver . . . | 0 | 13 | 0 |
| Swedish Copper . . | 1 | 11 | 0 |
| | 5 | 4 | 0 |

## No. 3.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 2 | 0 | 0 |
| Fine Gold | 5 | 0 | 0 |
| Fine Silver | 1 | 9 | 12 |
| Swedish Copper | 3 | 11 | 12 |
| | 12 | 1 | 0 |

## No. 4.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 2 | 0 | 0 |
| Fine Gold | 6 | 0 | 0 |
| Fine Silver | 1 | 14 | 0 |
| Swedish Copper | 4 | 2 | 0 |
| | 13 | 16 | 0 |

## No. 5.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins | 2 | 0 | 0 |
| Fine Gold | 8 | 0 | 0 |
| Fine Silver | 2 | 3 | 0 |
| Swedish Copper | 5 | 3 | 0 |
| | 17 | 6 | 0 |

No. 6.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Coins . . . . . | 4 | 0 | 0 |
| Fine Gold . . . . | 6 | 0 | 0 |
| Fine Silver . . . | 2 | 2 | 0 |
| Swedish Copper . . | 5 | 2 | 0 |
| | 17 | 4 | 0 |

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*Melting and Refining.*

In melting gold it will sometimes happen that steel or iron filings get into the gold; this may be removed by throwing in a piece of Sandiver about the size of a common nut. It will draw the iron or steel into the flux, and leave the gold; or Sublimate of Mercury will destroy the iron or steel.

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*To insure Gold Rolling well.*

Melt until a good heat; then take a teaspoonful of half Sal Ammoniac and half pow-

dered Charcoal. Stir it up well, then put on the cover for one minute, and pour.

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*Of Wet-Coloring the foregoing Alloys.*

This is performed in the following manner: Having annealed your work, and boiled it out so as to get it perfectly clean, take of Saltpetre 15 oz., of Alum 7 oz., and of Salt 7 oz.; pound them all fine, and mix well together; then provide a blacklead pot about 12 inches high, put your ingredients into it, and dissolve gradually. It must be on no account hurried, for, if it burns, the "color" will be spoiled. As the heat increases it will boil up; then add 2 oz. of Muriatic Acid, when the "color" will sink in the pot. Take a wooden spoon and stir it well, when it will again boil up. Take your work, which you have made clean, and tied in small parcels with platinum or fine silver wire, and immerse it in the "color" for four

minutes, keeping it on the move, so that the "color" may act upon all parts alike. At the end of that time take it out and rinse it well in boiling water, which you have ready in a kettle, with pint or quart basins, according to the quantity or size of your work. Next, place your work in the "color" for one minute and a half; take it out and rinse well in fresh hot water. Two fluid oz. of hot water must then be added, when the "color" will sink in the pot, but will rise again; put in your work for one minute, again rinsing it in fresh hot water, when you will find it begin to brighten. Lastly, put your work in the "color" for half a minute longer, rinsing it for the last time in clean hot water, after which you will find it a beautiful color. This process, by a little attention, never fails.

NOTE.—The mixture of "coloring" should be according to the weight of work. If a small quantity, say 2 oz., the proportions should be--

| | |
|---|---|
| Saltpetre . . . . | 8 oz. |
| Alum . . . . . | 4 oz. |
| Common Salt . . . | 4 oz. |
| Muriatic Acid . . . | 1 oz. |

If 5 oz. of work, double the quantities, and so in proportion to the weight; but practice will make perfect.

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*Of Wet-Coloring by the German Process.*

Tie up your work in small bunches with fine silver or platinum wire; then, for 3 oz. of work, take a blacklead pot, 6 or 7 inches high, and, having previously placed your work in hot water, put it on the fire; when thoroughly dry, put into it of Saltpetre 6 oz., and of Common Salt 3 oz.; stir them well with a wooden spoon, and when thoroughly dried fine and hot, put into it 5 fluid oz. of Muriatic Acid. When boiling up, put in your bunch of work, having previously shaken the water from it, and keep it on the move for three minutes, care being

taken to keep it well covered all this time. At the end of this time, take it out and plunge it into a vessel of clean hot water, and finally into a second vessel of the same. Add then to your "color" in the pot 6 fluid oz. of hot water, and when it boils up again, after being thus diluted, put in your work for one minute longer, and again rinse it as before directed. when it will be found to be a beautiful color.

Too much clean hot water cannot be used for plunging the work in each time through the "color." If the work is hollow-work and bulky, not quite so much as 3 oz. should be put, as it is not so effectually covered in the pot.

In Wet-Coloring it sometimes happens that the color is rather dead; or it may happen that the "color" burns, which causes the work to look brown: this is a precipitation which may be removed by scratching at the lathe with stale beer or ale, with a fine brass wire brush, similar to the round hair-brushes used for polishing.

In Coloring, a large stone jar should be pro-

vided, into which should be emptied your "color" when done with, for the pot should be washed out each time, so as to be ready when required again. Into this stone jar should also be emptied the water in which you rinse your work, as it all contains gold to a great extent.

All things connected with the process should be kept clean and free from grease of any kind.

No iron ought to be near this Wet-Color in the pot, as it is most injurious.

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*To Collect the Gold lost in Coloring.*

Where there is a large amount of work made and colored, the loss is estimated at 1 dwt. or more per oz.; this in time becomes a serious matter. To collect that loss the following method is used. Take one of the basins you use, and put into it a handful of Sulphate of Iron, and pour boiling water upon it to dissolve it. When dissolved, pour it into your stone jar in which you keep your "color"-water; this pre-

cipitates the small particles of gold, and must be done each time you color. It should be collected every six months, if the amount of work colored be much, in the following manner:

With a syphon draw off the water from your jar, but in doing so be careful not to disturb the sediment which is at the bottom, for it contains the gold. After you have got off what water you can, it must be washed with three or four kettlefuls of boiling water, each kettleful being done separately, and allowed to cool each time and the water carefully got off: this is to clear the sediment of any acid. It is known to be sufficiently done by touching the water with the finger and tasting it.

When freed from acid, put it into an iron pan and dry gradually by the fire. When dried, put it into an iron ladle and make it red hot, stirring it carefully with a tobacco-pipe, care being taken not to spill it. It will turn red in annealing.

Having proceeded thus far, take of the sedi-

ment thus prepared 1 oz., of Borax pounded fine 15 dwts., of common bottle-glass pounded fine 5 dwts., and of Pearlash pounded fine 4 dwts.; mix all well together. Put this into a skittle-pot, which should have a cover, and in placing it in the furnace there should be a small pot reversed for the skittle-pot to stand on. You then lay your fire, which must be lighted at the top, so that the light particles of gold may be carried downwards. After the fire is at its height it is continued for forty minutes, then allowed to burn out, when the metal will be found at the bottom of the pot. This you refine with Saltpetre.

Even if jewellers did not wish to collect for themselves, they would find the benefit of taking care of this sediment, and selling it to the refiners.

☞ Too much care cannot be taken in procuring pure Spirits of Salts, or Muriatic Acid.

## *Alloys of Gold for Enamelling.*

### Pale Gold for Coloring, Enamelling, or Lapping.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 9 | 0 |
| Swedish Copper . . | 0 | 2 | 12 |
| | 1 | 11 | 12 |

### Another Ditto.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 9 | 0 |
| Swedish Copper . . | 0 | 3 | 12 |
| | 1 | 12 | 12 |

### Another Ditto.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 10 | 0 |
| Swedish Copper . . | 0 | 3 | 12 |
| | 1 | 13 | 12 |

*Alloys of Gold for Enamelling* (*continued*).

### Enamelling Gold No. 1.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold | 1 | 0 | 0 |
| Fine Silver | 0 | 1 | 12 |
| Swedish Copper | 0 | 2 | 12 |
| | 1 | 4 | 0 |

### Enamelling Gold from Sterling.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Sterling Gold | 1 | 0 | 0 |
| Fine Silver | 0 | 0 | 18 |
| Swedish Copper | 0 | 2 | 0 |
| | 1 | 2 | 18 |

### Enamelling Gold Solder.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Alloyed | 0 | 1 | 0 |
| Fine Silver | 0 | 0 | 4 |
| | 0 | 1 | 4 |

*Alloys of Gold for Enamelling* (*continued*).

### Another Ditto, 43s. per Oz.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 12 | 0 |
| Fine Silver . . . | 0 | 7 | 3 |
| Swedish Copper . . | 0 | 6 | 0 |
| | 1 | 5 | 3 |

### Enamelling Gold No. 2—Cost 50s. per Oz.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 9 | 12 |
| Swedish Copper . . | 0 | 7 | 12 |
| | 1 | 17 | 0 |

### Enamelling Gold No. 3.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 14 | 0 |
| Swedish Copper . . | 0 | 8 | 0 |
| | 2 | 2 | 0 |

*Alloys of Gold for Enamelling* (*continued*).

**Enamelling Gold No. 4.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold | 2 | 5 | 0 |
| Fine Silver | 1 | 6 | 0 |
| Swedish Copper | 1 | 0 | 0 |
| Pin-Brass | 0 | 5 | 0 |
| | 4 | 16 | 0 |

**Enamelling Gold No. 5.**

| | Oz | Dwts | Grs. |
|---|---|---|---|
| Fine Gold | 1 | 0 | 0 |
| Fine Silver | 0 | 12 | 0 |
| Swedish Copper | 0 | 6 | 0 |
| | 1 | 18 | 0 |

**Enamelling Gold No. 6.—For Transparent Enamelling.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold | 1 | 0 | 0 |
| Fine Silver | 0 | 14 | 0 |
| Swedish Copper | 0 | 6 | 0 |
| | 2 | 0 | 0 |

## *Alloys of Gold for Enamelling* (*continued*).

### Gold Solder for Enamelled Work.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 1 | 0 | 0 |
| Swedish Copper . . | 0 | 10 | 0 |
| Silver Solder . . . | 0 | 8 | 8 |
| | 2 | 18 | 8 |

## *Pale Gold Alloys for Polishing, Etc.*

### No. 1.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 8 | 0 |
| Swedish Copper . . | 0 | 3 | 12 |
| | 1 | 11 | 12 |

### No. 2.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 1 | 20 |
| Swedish Copper . . | 0 | 1 | 4 |
| | 1 | 3 | 0 |

## *Pale Gold Alloys (continued).*

### 18 Carat, Pale.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 4 | 0 |
| Swedish Copper . . | 0 | 2 | 15 |
| | 1 | 6 | 15 |

### Another 18 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 12 |
| Fine Silver . . . | 0 | 3 | 8 |
| Swedish Copper . . | 0 | 3 | 8 |
| | 1 | 7 | 4 |

### Pale Gold Solder.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Alloyed . . . | 0 | 1 | 6 |
| Fine Silver . . . | 0 | 1 | 0 |
| | 0 | 2 | 6 |

## *Ordinary Bright Gold.*

TABLE SHOWING THE PROPORTION OF ALLOY WITH FROM 1 OZ. UP TO 6 OZ. OF FINE GOLD.

| FINE GOLD. | | | FINE SILVER. | | | COMPOSITION. | | | TOTAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Oz. | Dwt. | Grs. | Oz. | Dwt. | Grs. | Oz. | Dwt. | Grs. | Oz. | Dwt. | Grs. |
| 1 | 0 | 0 | 0 | 5 | 0 | 1 | 8 | 0 | 2 | 13 | 0 |
| 2 | 0 | 0 | 0 | 10 | 0 | 2 | 16 | 0 | 5 | 6 | 0 |
| 3 | 0 | 0 | 0 | 15 | 0 | 4 | 4 | 0 | 7 | 19 | 0 |
| 4 | 0 | 0 | 1 | 0 | 0 | 5 | 12 | 0 | 10 | 12 | 0 |
| 5 | 0 | 0 | 1 | 5 | 0 | 7 | 0 | 0 | 13 | 5 | 0 |
| 6 | 0 | 0 | 1 | 10 | 0 | 8 | 8 | 0 | 15 | 18 | 0 |

### Composition for the Above.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Copper . . . | 44 | 0 | 0 |
| Spelter . . . . | 8 | 0 | 0 |
| | 52 | 0 | 0 |

## *Ordinary Bright Gold Wire.*

TABLE SHOWING THE PROPORTIONS OF ALLOY FROM 1 OZ. UP TO 21 OZ.

| FINE GOLD. | | | FINE SILVER. | | | SWEDISH COPPER. | | | TOTAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Oz. | Dwts. | Grs. | Oz. | Dwts. | Grs. | Oz. | Dwts. | Grs. | Oz. | Dwts. | Grs. |
| 0 | 5 | 21 | 0 | 7 | 6 | 0 | 6 | 21 | 1 | 0 | 0 |
| 0 | 11 | 18 | 0 | 14 | 12 | 0 | 13 | 18 | 2 | 0 | 0 |
| 0 | 17 | 15 | 1 | 1 | 18 | 1 | 0 | 15 | 3 | 0 | 0 |
| 1 | 15 | 6 | 2 | 3 | 12 | 2 | 1 | 6 | 6 | 0 | 0 |
| 2 | 12 | 21 | 3 | 5 | 6 | 3 | 1 | 21 | 9 | 0 | 0 |
| 3 | 10 | 12 | 4 | 7 | 0 | 4 | 2 | 12 | 12 | 0 | 0 |
| 4 | 8 | 3 | 5 | 8 | 18 | 5 | 3 | 3 | 15 | 0 | 0 |
| 5 | 5 | 18 | 6 | 10 | 12 | 6 | 3 | 18 | 18 | 0 | 0 |
| 6 | 3 | 9 | 7 | 12 | 6 | 7 | 4 | 9 | 21 | 0 | 0 |

## *Alloys for Gold Pens.*

### Alloy for Best Pens.—52s.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 5 | 0 |
| Swedish Copper . . | 0 | 7 | 18 |
| Spelter . . . . . | 0 | 1 | 6 |
| | 1 | 14 | 0 |

### Solder for the Above.—43s.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 12 | 0 |
| Fine Silver . . . | 0 | 7 | 3 |
| Swedish Copper . . | 0 | 6 | 0 |
| | 1 | 5 | 3 |

### Medium Quality Pens.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Composition . . . | 1 | 13 | 0 |
| | 2 | 13 | 0 |

## *Alloys for Gold Pens (continued).*

### Composition for the Above.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 17 | 0 |
| Swedish Copper . . | 5 | 15 | 0 |
| Spelter . . . . | 0 | 18 | 20 |
| | 8 | 10 | 20 |

### Solder for the Foregoing.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 1 | 0 | 0 |
| Pin Brass . . . . | 1 | 0 | 0 |
| | 3 | 0 | 0 |

### Gold for Common Pens.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 2 | 0 | 0 |
| Swedish Copper . . | 1 | 0 | 0 |
| | 4 | 0 | 0 |

*Alloys for Gold Pens (continued).*

**Solder for the Foregoing.**

| | Oz | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 2 | 0 | 0 |
| Pin-Brass . . . . | 1. | 0 | 0 |
| | 4 | 0 | 0 |

## *Alloys of Gold with Brass.*

### Alloy No. 1.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 5 | 6 |
| Swedish Copper . . | 0 | 3 | 12 |
| Pin-Brass . . . . | 0 | 18 | 0 |
| | 2 | 6 | 18 |

### Alloy No. 2.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 4 | 0 |
| Swedish Copper . . | 0 | 4 | 0 |
| Pin-Brass . . . . | 0 | 16 | 0 |
| | 2 | 4 | 0 |

### Alloy No. 3.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 5 | 12 |
| Swedish Copper . . | 0 | 3 | 12 |
| Pin-Brass . . . . | 0 | 19 | 6 |
| | 2 | 8 | 6 |

*Alloys of Gold with Brass (continued).*

☞ in melting the Brass-Gold it often happens the gold, to the naked eye, seems all right, yet, when it comes to be flattened at the mill, it is full of air and not fit for use; this may be avoided by having a tobacco-pipe to stir the metal when in fusion. The nature of the alloys, and the quantity of Borax used as flux, are the cause; but acting on the advice given, and by applying sufficient heat, this may be avoided.

**Alloy No. 4.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 3 | 21 |
| Swedish Copper . . | 0 | 9 | 3 |
| Composition . . . | 0 | 5 | 6 |
| | 1 | 18 | 6 |

*Alloys of Gold with Brass (continued).*

**Alloy No. 5.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 15 | 9 |
| Fine Silver . . . | 0 | 5 | 19 |
| Swedish Copper . . | 0 | 3 | 21 |
| Composition . . . | 0 | 15 | 0 |
| | 2 | 0 | 1 |

**Composition for the Above.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Swedish Copper . . | 1 | 0 | 0 |
| Spelter . . . . | 0 | 5 | 0 |
| | 1 | 5 | 0 |

In making solder for the foregoing alloys, take of the alloyed gold you are using—

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Gold Alloyed . . . | 0 | 1 | 0 |
| Fine Silver . . . | 0 | 0 | 12 |
| | 0 | 1 | 12 |

*Miscellaneous Gold Alloys.*

### 45s. Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Composition * . . . | 1 | 0 | 0 |
| | 2 | 0 | 0 |

### Solder for the Above.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 15 | 0 |
| Swedish Copper . . | 0 | 15 | 0 |
| | 2 | 10 | 0 |

### 12 Carat Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 10 | 0 |
| Swedish Copper . . | 0 | 9 | 6 |
| | 1 | 19 | 6 |

* For Composition for the above, see page 51.

## *Miscellaneous Gold Alloys (continued).*

### Another 12 Carat.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 12 |
| Fine Silver . . . | 0 | 6 | 12 |
| Swedish Copper . . | 0 | 11 | 12 |
| Spelter . . . . | 0 | 1 | 12 |
| | 2 | 0 | 0 |

## Table of Alloys.

For Different Qualities of Gold.

| Quality. | Fine Gold. | | | Composition. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Oz | Dwt | Grs. | Oz. | Dwt. | Grs. | Oz. | Dwt. | Grs. |
| 9 Carat | 0 | 7 | 12 | 0 | 12 | 12 | 1 | 0 | 0 |
| 12 " | 0 | 10 | 0 | 0 | 10 | 0 | 1 | 0 | 0 |
| 15 " | 0 | 12 | 12 | 0 | 7 | 12 | 1 | 0 | 0 |
| 18 " | 0 | 15 | 0 | 0 | 5 | 0 | 1 | 0 | 0 |
| 22 " | 0 | 18 | 18 | 0 | 1 | 6 | 1 | 0 | 0 |

*Miscellaneous Gold Alloys (continued).*

### Composition for the Above.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 3 | 5 | 12 |
| Swedish Copper . . | 8 | 12 | 12 |
| Spelter . . . . | 1 | 18 | 6 |
| | 13 | 16 | 6 |

### Alloy for Gold Chains.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 11 | 6 |
| Fine Silver . . . | 0 | 2 | 5 |
| Swedish Copper . . | 0 | 6 | 13 |
| | 1 | 0 | 0 |

### Another Ditto.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 9 | 0 |
| Swedish Copper . . | 0 | 8 | 0 |
| | 1 | 17 | 0 |

*Miscellaneous Gold Alloys (continued).*

### 35s. Gold for Pins.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 5 | 0 |
| Swedish Copper . . | 1 | 0 | 0 |
| Spelter . . . . | 0 | 5 | 0 |
| | 2 | 10 | 0 |

### Dry-Colored Scrap reduced to 35s. Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Colored Scrap . . . | 1 | 9 | 12 |
| Fine Silver . . . | 0 | 2 | 0 |
| Swedish Copper . . | 0 | 17 | 12 |
| Spelter . . . . | 0 | 4 | 0 |
| | 2 | 13 | 0 |

### Bright Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 7 | 0 |
| Composition * . . . | 1 | 6 | 0 |
| | 2 | 13 | 0 |

* For Composition for the above, see page 48.

*Miscellaneous Gold Alloys* (*continued*).

**Common Gold No. 1.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . | 0 | 8 | 0 |
| Composition * . . . | 1 | 12 | 0 |
| | 3 | 0 | 0 |

**Common Gold No. 2.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 0 | 5 | 0 |
| Fine Silver . . . | 0 | 3 | 6 |
| Swedish Copper . . | 0 | 6 | 12 |
| | 0 | 14 | 18 |

**Medium Gold.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 0 | 0 |
| Fine Silver . . . | 0 | 12 | 0 |
| Swedish Copper . . | 0 | 13 | 0 |
| | 2 | 5 | 0 |

* For Composition for the above, see page 48.

*Miscellaneous Gold Alloys (continued).*

"California."

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 11 | 0 | 0 |
| Composition . . . | 15 | 10 | 0 |
| | 26 | 10 | 0 |

Composition for "California."

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 15 | 12 | 0 |
| Swedish Copper . . | 67 | 0 | 0 |
| Spelter . . . . | 11 | 0 | 0 |
| | 93 | 12 | 0 |

Common Gold, from "California."

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| "California" . . . | 8 | 0 | 0 |
| Fine Silver . . . | 13 | 16 | 0 |
| Swedish Copper . . | 6 | 16 | 0 |
| | 28 | 2 | 0 |

*Miscellaneous Gold Alloys (continued).*

**To reduce 35s. Scrap to Common Gold.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Scrap . . . . | 9 | 18 | 0 |
| Composition * . . . | 2 | 2 | 0 |
| | 12 | 0 | 0 |

**29s. Gold.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Gold . . . . | 1 | 13 | 6 |
| Fine Silver . . . | 1 | 12 | 12 |
| Swedish Copper . . | 1 | 16 | 6 |
| Spelter . . . . | 0 | 4 | 0 |
| | 5 | 6 | 0 |

Will stand the Aquafortis very well.

---

*To Clean Old Work that is Tarnished.*

This is done by heating the articles gently with a blow-pipe, and boiling out in rather strong pickle of Muriatic Acid; it may be re-

* For Composition for the above, see page 58.

moved by boiling in Chloride of Lime and water in a pipkin, and touching the work at a lathe with a scratch-brush.

*To Remove Soft-Solder from Work to be Mended or Colored.*

Remove what you can by the scraper, or otherwise gently heating it, so that you may shake all off that you can. Place it in Spirits of Salts for some time. This receipt is useful where hard-soldering is required, whether in colored or bright work.

*Silver Alloys.*

**Sterling Silver.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 11 | 2 | 0 |
| Swedish Copper . . | 0 | 18 | 0 |
| | 12 | 0 | 0 |

## *Silver Alloys (continued).*

### Equal to Sterling.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Swedish Copper . . | 0 | 1 | 12 |
| | 1 | 1 | 12 |

### Another Ditto.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Swedish Copper . . | 0 | 5 | 0 |
| | 1 | 5 | 0 |

### Alloy for Plating.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Swedish Copper . . | 0 | 10 | 0 |
| | 1 | 10 | 0 |

*Silver Alloys* (*continued*).

**Silver Solder.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Pin Brass . . . . | 0 | 10 | 0 |
| | 1 | 10 | 0 |

**Another Ditto.**

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Pin-Brass . . . . | 0 | 10 | 0 |
| Pure Spelter . . . | 0 | 2 | 0 |
| | 1 | 12 | 0 |

In fine silver filigree-work, fine silver is always used for the filigree. The Frame-work is generally made of sterling silver. The solder for such work is as follows :

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 0 | 4 | 6 |
| Pin-Brass . . . . | 0 | 1 | 0 |
| | 0 | 5 | 6 |

*Silver Alloys* (*continued*).

### Copper Solder, for Plating.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 0 | 10 | 0 |
| Swedish Copper . . | 0 | 10 | 0 |
| | 1 | 0 | 0 |

This is a useful solder for plating or soldering silver work; it never eats as does silver solder.

### Common Silver, for Chains.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 6 | 0 | 0 |
| Swedish Copper . . | 4 | 0 | 0 |
| | 10 | 0 | 0 |

### Solder for the above.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 0 | 16 | 0 |
| Swedish Copper . . | 0 | 0 | 12 |
| Pin-Brass . . . . | 0 | 3 | 12 |
| | 1 | 0 | 0 |

*Silver Alloys* (*continued*).

### Silver Solder, for Enamelling, 4s. per Oz.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 0 | 14 | 0 |
| Swedish Copper . . | 0 | 8 | 0 |
| | 1 | 2 | 0 |

### Common Silver Solder.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 20 | 0 | 0 |
| Pin-Brass . . . . | 13 | 0 | 0 |
| Spelter . . . . | 1 | 0 | 0 |
| | 34 | 0 | 0 |

### Ditto, for filling Signet Rings.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 20 | 0 | 0 |
| Swedish Copper . . | 3 | 8 | 0 |
| Pin-Brass . . . . | 13 | 0 | 0 |
| Spelter . . . . | 1 | 0 | 0 |
| | 37 | 8 | 0 |

## *Silver Alloys (continued).*

### Quick Silver-Solder.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Pin-Brass . . . . | 0 | 10 | 0 |
| Bar Tin . . . . | 0 | 2 | 0 |
| | 1 | 12 | 0 |

### Silver Solder, for Gold Plating.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Swedish Copper . . | 0 | 5 | 0 |
| Pin Brass . . . . | 0 | 5 | 0 |
| | 1 | 10 | 0 |

### Bismuth Solder.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Bismuth . . . . | 12 | 0 | 0 |
| Lead . . . . . | 15 | 0 | 0 |
| Tin . . . . . | 21 | 0 | 0 |
| | 48 | 0 | 0 |

## *Imitations.*

### Imitation Silver.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 1 | 0 | 0 |
| Nickel . . . | 1 | 11 | 0 |
| Swedish Copper . . | 2 | 9 | 0 |
| | 5 | 0 | 0 |

*or,*

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 3 | 0 | 0 |
| Nickel . . . . | 1 | 11 | 0 |
| Swedish Copper . . | 2 | 9 | 0 |
| Spelter . . . . | 0 | 10 | 0 |
| | 7 | 10 | 0 |

### Imitation Gold.

| | Oz. | Dwts. | Grs. |
|---|---|---|---|
| Fine Silver . . . | 2 | 5 | 0 |
| Swedish Copper . . | 1 | 0 | 0 |
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| | 4 | 5 | 0 |

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* For Composition see page 43

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